BY STEPHEN I. PELTON, M.D.

ID CONSULT

Delaying Vaccines Risks Serious Infection

Here's an important message for the vaccine-hesitant parents in your practice: Delaying immunizations places your infant at risk for serious infection.

Physicians who care for children have been increasingly encountering parents who are fearful about vaccines and reluctant to allow their children to be vaccinated. A new, worrisome concept circulating on the Internet and elsewhere is that instead of skipping vaccines altogether, children can be vaccinated on "selective" or "alternative" schedules that either eliminate some vaccines or spread the schedule out over a longer period of time. To many parents and perhaps even some physicians, these schedules may sound attractive, but they are not, because they leave young infants unprotected at the very time they are most vulnerable to vaccine-preventable diseases and their complications.

The idea that the currently recommended childhood immunization schedule can be successfully altered is being fostered by a pediatrician named Robert W. Sears—aka "Dr. Bob"—who has written a book entitled, "The Vaccine Book: Making the Right Decision for Your Child." In it, he presents two immunization schedules that differ substantially from the one recommended by the Centers for Disease Control and Prevention, the American Academy of Pediatrics, and the American Academy of Family Physicians. He promotes these schedules as acceptable alternatives for the vaccine-adverse family.

Both Dr. Bob's selective and alternative schedules involve spreading out fewer vaccines over a period of six visits in the first 7 months of life (at 2, 3, 4, 5, 6, and 7 months), an inconvenience that in and of itself may further challenge the administration of timely immunizations. Both of his schedules delay the first pneumococcal conjugate vaccine dose until 3 months. Influenza vaccination isn't included at all in his selective schedule, and doesn't appear until 21 months of age on the alternative schedule.

But perhaps even more disturbing than selective or alternative schedules that fail to incorporate age-related epidemiology and risk for complications is Dr. Sears's perspective on parents who choose to delay all vaccinations until their child is 6 months or older. Although he states in his book that he doesn't advise this, he also tells parents that if they choose to postpone immunizations until the child is 2 years old, "it doesn't make sense to then go ahead and catch up with all the shots," thus giving parents the idea that skipping early immunizations altogether is an acceptable and perhaps even sensible option.

He also recommends certain "precautions to take if you don't vaccinate," including "ensuring a healthy immune system" through omega-3 oil supplements and other vitamins.

In my opinion, immunizing young infants is very important, and age-related epidemiology and risk for complications support early vaccination. This is particularly true for the following four vaccine-preventable diseases for which there is still significant risk of exposure and evidence that severity is greater in the first year of life:

▶ **Pertussis.** A single dose of pertussis vaccine does not appear to offer significant protection. Infants with pertussis who received fewer diphtheria-tetanus-pertussis doses were significantly more likely to be hospitalized, demonstrating that underimmunized infants have more serious disease (JAMA 2003;290:2968-75).

In the United States, there were approximately 140 pertussis deaths in infants less than 3 months old between 2000 and 2006 and approximately 100 times as many hospitalizations, often requiring intensive care. We see sharp declines in disease morbidity after 4 months of age, most likely because that's when children receive a second dose of pertussis-containing vaccine. Thus, prevention of early disease is critical and vaccination is part of that strategy, in conjunction with the adolescent/adult vaccine formulation

(Tdap) for parents and teenagers.

► **Invasive pneumococcal disease.** Here again, we have data showing that a single dose of pneumococcal conjugate vaccine does not offer significant disease protection (Vaccine 2006;24:2514-20). In Massachusetts, where we have been tracking invasive pneumococcal disease (IPD) in children younger than 18 years old, mortality from IPD in children less than 1 year of age is approximately 10 times higher than for those aged 1-10 years—about 3% of those who develop IPD (Hsu, K., et al., submitted for publication).

► **Influenza.** Children less than 2 years of age are at greater risk for influenza than are older children and are hospitalized with it more often (MMWR 2008;57[RR07]:1-60). Children younger than 2 years also may have higher concentrations of virus in the nasopharynx as well as longer durations of shedding, thus frequently rendering them sources of contagion to household and day care contacts.

Because there is no influenza vaccine for children less than 6 months of age, vaccinating their siblings and all adults around them—a process known as "cocooning"—is the only current strategy for reducing exposure among the most vulnerable children in the community. Starting influenza immunization at 6 months of age, with a second dose 1 month later, provides protection against influenza disease and potentially against bacterial pathogens that tend to take advantage of weakened host defenses during influenza infection.

► **Varicella.** It's a widespread misconception that varicella is serious only in adults. In fact, prior to the licensure of the vaccine, the case-fatality rate from pneumonia, encephalitis, and secondary bacterial sepsis among children less than 1 year of age with chicken pox was 7 times higher than that of those aged 1-10 years, at 6.23 versus 0.75 cases per 100,000 children (MMWR 1996;45[RR-11]:1-36). During the 1990's, the combination of varicella and group A streptococcus was a deadly one, often leading to extensive necrotizing infection or sepsis, hospitalization, and death. Currently, there is concern that methicillin-resistant *Staphylococcus aureus* (MRSA) also may be an opportunistic pathogen any time there is a break in the skin.

According to the alternative schedule, it's okay to delay varicella vaccine until 18 months; the selective schedule advises waiting until the child is 10 years old, ordering antibody titers, and immunizing only if the child is found susceptible. Clearly, these approaches do not provide early protection from disease. Fortunately, there is little wild-type varicella currently circulating in the community, and the cases that do break through in vaccinated children are usually mild, with small numbers of lesions. However, if immunization rates fall and wild-type varicella becomes more common, more cases complicated by MRSA are likely to occur.

That is one reason why I am particularly concerned with the recent trend of parents organizing "chicken pox parties" to deliberately expose their children to varicella, under the mistaken belief that this is a good way to achieve protection without immunization.

Because there is still no chicken pox vaccine available for children less than 1 year of age, the only way to prevent disease in this high-risk group is to prevent exposure by immunizing their siblings, day care contacts, babysitters, and anyone else with whom they come into regular contact. Not only do the chicken pox parties demonstrate a lack of understanding of the potential seriousness of varicella, but they completely ignore the potential for secondary cases within a household in susceptible adults or infants. Please do your best to educate parents in your practice about the risks of wild-type varicella in young infants and the potential for MRSA suprainfection.

While delaying immunization may make some people feel good, it leaves the most vulnerable of our patients at great risk. It will take time to explain to parents that the currently recommended vaccine schedule incorporates our knowledge about age-related susceptibility, morbidity, and mortality. Delay is not in their child's interest. ■

DR. PELTON *is chief of pediatric infectious disease and also is the coordinator for the maternal-child HIV program at Boston Medical Center. Dr. Pelton has participated in an advisory board meeting on meningococcal conjugate vaccines, pneumococcal conjugate vaccines, and DTaP-IPV-Hib and DTaP-IPV-Hep B combination vaccines at Novartis, GlaxoSmithKline, Wyeth, and Sanofi Pasteur and has received honoraria for his time and effort. He has received investigator-initiated grants from GSK for work on NTHi carriage and from Wyeth for enhanced statewide surveillance of invasive pneumococcal disease. Write to Dr. Pelton at our editorial offices at pdnews@elsevier.com.*